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Appln. No.: 10/643,097

Replv to Office action of January 17, 2007**REMARKS**

Claims 1 and 8 have been amended and claims 2 and 9 have been cancelled.

Accordingly, claims 1 and 3-8 remain in this application.

**Claim Rejections Under 35 USC §103(a)**

Applicant, upon review of the Examiner's comments regarding equivalency of PE and PTFE materials, respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 1 and 6-8 over Thorsrud (US Pat. No. 4,968,726, referred to hereafter as "the '726 patent") in view of the Encyclopedia of Polymer Science and Technology (1996), referred to hereafter as "Encyclopedia." Regardless, Applicant has amended claim 1 to incorporate additional limitations, and thus, Applicant believes the rejection should be withdrawn, and the claims allowed.

Claim 1, as amended calls for a preparing mixture of PTFE resin powder and a susceptor material. Then, feeding the mixture into a compaction zone to at least partially compact and shape the mixture, and providing a continuous flow of the mixture from the compaction zone to a heating zone and heating and sintering the mixture within the heating zone by exciting the susceptor material by application of wave energy and drawing a vacuum on the mixture within the heating zone while sintering the mixture to extract air from the mixture.

The Examiner has acknowledged that the '726 patent fails to teach sintering PTFE. In contrast, the '726 patent teaches sintering ultra high molecular weight polyethylene (UHMWPE). Accordingly, the Examiner looks to the Encyclopedia to arrive at the conclusion that polyethylene (PE) and PTFE are equivalent alternate materials with respect to their capacity for radio-frequency heating, citing page 7 of the Encyclopedia, which shows that neither PE or PTFE responded to dielectric heating. Given the Encyclopedia states that neither materials respond to dielectric heating, the Examiner reaches the conclusion that the materials are equivalent materials with respect to their capacity for radio-frequency heating, and thus, it would have been obvious for one of ordinary skill in the art to use PTFE as an equivalent to the UHMWPE disclosed in the '726 patent. With all due respect, this conclusion requires improper leaps, as it is not

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without undue experimentation that Applicant believes one of ordinary skill would be required to conduct to arrive at the invention as claimed herein.

Rather than showing that PE and UHMWPE are equivalent materials with respect to their capacity for radio-frequency heating, what the Encyclopedia teaches is that both were non-responsive to dielectric heating under specific testing parameters. Other than stating that they were both non-responsive to dielectric heating, it does not teach, let alone suggest that they equivalent materials with respect to dielectric heating potential. The Encyclopedia shows that PE has a loss index of 0.0008 and PTFE a loss index of 0.0004. Given these values, it can be concluded that the ability to dielectrically heat PTFE is twice as difficult, and thus, not as easy a leap as the Examiner would suggest. This is evidenced in the '726 patent, via an equation,  $P = 1.41(E/D)^2 \times f \times E''$ , where P is the power absorption in watt/in<sup>3</sup>, and E'' is the dielectric loss factor, also referred to as the loss index. Accordingly, with PTFE having half the loss factor of PE, it absorbs twice the power than PE. As such, these materials are far from being equivalent materials when it comes to dielectric heating potential. As such, Applicant contends that there is no teaching or suggestion within any of the references, whether considered separately or combined to arrive at Applicant's claimed method for fabricating PTFE material.

Further, claim 1 has been amended to include that limitations of claim 2, and thus, now recites that a vacuum is drawn on the mixture within the heating zone downstream from a compaction zone while sintering the mixture to extract air from the mixture.

The Examiner acknowledges that the '726 patent and the Encyclopedia fail to teach drawing a vacuum during sintering. Accordingly, the Examiner turns to Dolan (US Pat. No. 5,646,192, referred to hereafter as "the '192 patent.") to arrive at the conclusion that drawing a vacuum during sintering is well known. However, the '192 patent does not teach drawing a vacuum during sintering, let alone during a sintering process which is downstream from a separate compaction process, as claimed by Applicant. Rather, the '192 patent teaches processing articles in a vacuum compression mold of a desired shape under a vacuum pressure under a compression pressure. "Upon removal from the hot mold, the molded article can be cooled, then sintered" (Col. 5, lines 7-20). As such, the vacuum is not being applied during sintering in the '192 patent disclosure. In addition, the '192 patent teaches that "If desired, the compression can take place when a vacuum is pulled on the article. If desired the compression molded article (past tense) can be

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sintered..." (Col. 5, lines 36-39). Again, there is no teaching or suggestion to draw a vacuum during a sintering process, let alone during a sintering process downstream from a compaction process.

Accordingly, Applicant believes amended claim 1 defines patentable subject matter and to be in proper condition for allowance. Such action is respectfully requested.

Claims 3 and 4 have been amended to depend directly on amended claim 1, and thus, are believed to define patent subject matter for at least the same reasons and to be in proper condition for allowance. Such action is respectfully requested.

Claims 5-7 are dependent upon amended claim 1, and thus, are believed to define patentable subject matter for at least the same reasons. Such action is respectfully requested.

Claim 8 has been amended to incorporate the limitation from claim 9, and is believed to define patentable subject matter for at least the same reasons stated in support of amended claim 1 and to be in proper form for allowance. Such favorable action is respectfully requested.

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 1 and 5-8 over Adams et al (US Pat. 4,375,441, referred to hereafter as "the '441 patent") in view of the Encyclopedia and in further view of the '726 patent. Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed.

As stated previously in the last response and again in a prior Appeal Brief, in Adams et al., starting at Column 4, line 14, it is disclosed that the starting material have a sufficiently high "loss factor", also being referred to as "loss index" in the Encyclopedia, to be effectively heated with dielectric heat. In preferred embodiments, the starting materials are selected from polymers or polymer compositions having loss factors above about 0.08, preferably above 0.2. Given that this teaching is far outside the reach of Applicant's teaching in Claim 1, the Examiner looks to the Encyclopedia. Again, as noted in a prior Appeal Brief, the Encyclopedia states that it is not possible to dielectrically heat PTFE using current state of the art equipment (pg. 8, last sentence of the first full paragraph). Table 2 of the Encyclopedia shows a listing of various materials with their associated "loss index" and corresponding "response to dielectric heating." Based on a review of Table 2, the fact that PTFE has by far the lowest "loss index", half that of PE,

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which has a loss index of 0.0008, thus, making it the most highly improbable material listed to be dielectrically heated is evident. With this in mind, the Examiner looks to the '726 patent which teaches that PE can be dielectrically heated, and broadly states that the '441 patent and the Encyclopedia teach that PE and PTFE are equivalent alternative materials with respect to their capacity for radio-frequency heating because both resins cannot be heated by radio-frequency energy. For reasons already stated in support of claim 1 above, Applicant believes this conclusion to be filled with holes. How is it that PE, with a loss factor of 0.0008, and PTFE, with a loss factor of 0.0004, can be equivalent alternative materials with respect to their capacity for radio-frequency heating? As noted above, the '726 patent discloses an equation,  $P=1.41(E/D)^2 \times f \times E''$ , where  $E''$  is the dielectric loss factor. Accordingly, with PTFE having half the loss factor of PE, it absorbs twice the power than PE. As such, these materials are not equivalent materials when it comes to dielectric heating potential. Further, as amended, claim 1 requires drawing a vacuum during the sintering step, and thus, further defines patentable subject matter for reasons already stated above over all the references cited, whether considered separately, or in combination where proper.

Accordingly, Applicant believes claim 1 to define patentable subject matter and to be in proper condition for allowance. Such action is respectfully requested.

Claims 5-8 are believed to define patentable subject matter over the '441 patent in view of the Encyclopedia and in further view of the '726 patent for at least the same reasons stated above in support of claim 1. Accordingly, Applicant believes the rejection should be withdrawn, and the claims allowed. Such action is respectfully requested.

Applicant respectfully believes the Examiner has failed to meet the burden of establishing a prima facie case of obviousness by rejecting claims 2-4 and 9 over the '441 patent in view of the Encyclopedia and in further view of the '726 patent and the '192 patent.

For at least the same reasons stated above in support of amended claims 1 and 8, Applicant believes this rejection should be withdrawn, and the claims allowed. In particular, none of the references teach, let alone suggest drawing a vacuum during the sintering process, let alone downstream from a compaction process. Accordingly, Applicant believes these claims define patent subject matter and to be in proper condition for allowance. Such action is respectfully requested.

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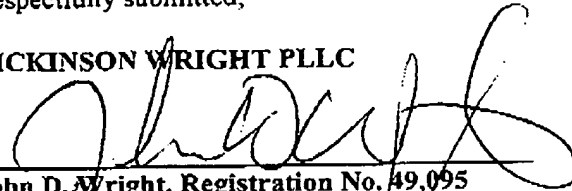
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It is believed that this application now is in condition for allowance. Further and favorable action is requested.

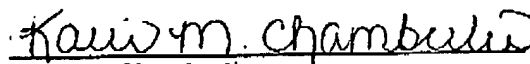
The Patent Office is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 04-1061.

Respectfully submitted,

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FEB 19, 2007  
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I hereby certify that this **Amendment** is being deposited with the United States Postal Service via facsimile 571-273-8300 addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on February 19, 2006.

  
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